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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,987	11/01/2000	Hayashi Takahashi	F-6666	1962

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06/27/2003

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EXAMINER

WILSON, DONALD R

ART UNIT

PAPER NUMBER

1713

11

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/703,987

Applicant(s)

TAKAHASHI ET AL.

Examiner

Donald R Wilson

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1713

-- Th MAILING DATE of this communication appears on th cover sh et with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/14/02
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 2-4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

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DETAILED ACTION

1. As this application has been corrected to a US National stage of PCT/JP99/05974, the restriction and election of species requirement of 4/4/02 has been withdrawn.

Claim Rejections - 35 USC § 112, Second Paragraph

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. ***Claims 2-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention***

4. Claim 2 is indefinite because 0.4 to 2.0 mmol/g of nitrogen content corresponds to 1.1 to 5.6 % nitrogen ($0.4 \times 28 \times 100 / 1000\%$ to $2.0 \times 28 \times 100 / 1000\%$), which doesn't appear to represent the inventive examples of the specification. It may be that applicant meant gram atoms rather than moles, i.e., an atomic weight of 14 rather than 28, but that meaning cannot be clearly arrived at from the specification as filed.

5. Claim 3 is indefinite because comonomers having acidic groups are not salts of carboxylic or sulfonic acids. An amendment to Claims 1 and 3 to refer to "an acidic group or salt thereof" as opposed to just an acidic group would overcome the rejection.

Claim Rejections - 35 USC § 102(b)/§ 103(a)

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 3-4 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tanaka or Takamiya '879.** Tanaka supplied by applicant is the US equivalent to JP 5-132858 referenced in the instant application.

10. As acknowledged by applicant, Tanaka discloses cross-linking of acrylic fibers with hydrazine, and hydrolysis of nitrile groups with alkali metal hydroxide. It is noted that applicant alleges that "--- the moisture absorbing rate and degree of swelling by water at 20°C at 65% RH show high values as from 25 to 50% and 150 to 300%, respectively." Presumably applicant meant the degree of swelling by water to be in water at 25°C as in the instant examples, else the absorbing rate and swelling by water would need to be approximately the same. Tanaka does not teach a degree of swelling in water, although an extrapolated moisture absorption rate for Fiber No. 2 at 100 % humidity would only be about 70%. As the moisture absorbing rate of the inventive examples of Tanaka range as low as 16 %, and the comparative examples as low as 8 %, it is not seen that the water swelling rates would all be as high as alleged, particularly as the degree of cross-linking by hydrazine (an indicator of swellability) in these examples is as high or higher than in the instant inventive examples. (See especially Fibers No. 3 and 6 of Table 1). All though the fibers of Tanaka are not made by the same process as applicants, it is not seen that the fibers encompassed by instant Claims 3 and 4 exclude those of Tanaka. The amount of carboxylic acid groups in the fibers of Tanaka exceed the amount corresponding to a starting concentration of at least 1 wt.% of acidic comonomer.

When the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon applicant to provide clear and convincing factual evidence that the respective products do in fact differ in kind - *In re Brown*, 59 CCPA 1063, 173 USPQ 685 (1972); *In re Fessman*, 180 USPQ 324 (CCPA 1974) - and to come forward with evidence

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establishing unobvious differences between the claimed product and the prior art product. *In re Marosi* 218 USPQ 290.

11. **Takamiya'879** has teachings similar to Tanaka in that acrylic fibers are cross-linked with hydrazine and carboxyl groups are introduced by treatment with alkali and/or acid (See Example 1). **Takamiya'879** also does not disclose what the swelling rates in water are. However, a number of samples with moisture absorption rates within the limits of instant Claim 4 are shown in Table 1. As above, in as much as the degree of cross-linking by hydrazine (an indicator of swellability) in these examples is as high or higher than in the instant inventive examples it is reasonable to expect that the degree of swelling would be within the limits of the instant claims. The amount of carboxylic acid groups in the fibers of **Takamiya'879** also exceed the amount corresponding to a starting concentration of at least 1 wt.%. The reference to *In re Marosi* is equally applicable here.

Allowed Claim and Allowable Subject Matter

12. Claim 1 is allowable over the prior art. The claim is directed to a method of producing cross-linked acrylic moisture absorbing fibers comprising the steps of cross-linking an acrylonitrile based copolymer having 1 to 5 wt.% of a comonomer containing an acidic group with hydrazine and hydrolyzing with sodium carbonate to further introduce acidic groups. Although prior art processes teach the preparation of high moisture absorbing acrylonitrile based fibers by cross-linking with hydrazine followed by hydrolysis to introduce acid groups, no prior art has been found which teaches the use of copolymers of acrylonitrile having the level of acid group containing monomers which applicant has shown is particularly advantageous. No prior art has been identified teaching specifically the use of aqueous sodium carbonate as the hydrolyzing media. However, this would seem to be within the scope of what one of ordinary skill in the art would interpret to be included in "--- an aqueous basic solution of alkali metal hydroxide, ammonia and [or (**Takamiya'879**)] the like", as for instance is taught by both Tanaka and **Takamiya'879** (col. 3, lines 7-17, col. 4, lines 42-46, respectively).

13. Claim 2 would also be allowable if it can be amended to overcome the rejection under 35 U.S.C. § 112, second paragraph.

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Art of Interest/Technological Background

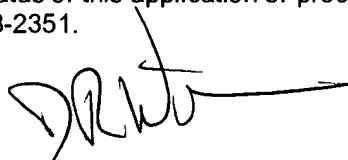
14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
15. Takamiya'390, Nishida and Nakajima each teach cross-linking of acrylonitrile-based fibers with hydrazine and subsequent hydrolysis to introduce carboxylic acid groups, and are cited as being of interest.

Future Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald R Wilson whose telephone number is 703-308-2398.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 703-308-2450. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications. The unofficial direct fax phone number to the Examiner's desk is 703-872-9029.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-2351.



Donald R Wilson
Primary Examiner
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